

United States Court of Appeals for the Federal Circuit

05-1321
(Serial No. 09/312,992)



IN RE SCOTT E. JOHNSTON

DECIDED: January 30, 2006

Before MICHEL, Chief Judge, NEWMAN and BRYSON, Circuit Judges.

NEWMAN, Circuit Judge.

Scott E. Johnston appeals the decision of the United States Patent and Trademark Office Board of Patent Appeals and Interferences, affirming the examiner's rejection of all the claims in patent application No. 09/312,992, entitled "Large Diameter Spirally Formed Pipe," as anticipated or obvious. We affirm the decision of the Board.

BACKGROUND

Mr. Johnston's patent application is for large diameter spiral pipe, in excess of 12 or 15 feet in diameter, formed by bending a long sheet of metal or other ductile material into a helix, and then joining the adjacent edges by welding or other means to form a pipe into shapes such as cylindrical or arched. The claims at issue are directed to the spiral pipes themselves. The following claims are representative:

1. A spirally formed pipe, comprising an elongated strip of ductile material formed into jointed, adjacent helical convolutions, having a diameter larger than 15 feet.
5. A spirally formed pipe, comprising an elongated strip of ductile material formed into jointed, adjacent helical convolutions, reshaped into an arch shape, having a beginning diameter above 144 inches.
9. A spirally formed pipe larger than 144 inches in diameter before reshaping into an arch shape.

The Board rejected the claims as unpatentable in view of several references describing silos, storage tanks, and other cylindrical structures formed from strips of metal bent into a helical shape and joined at the edges. U.S. Patent No. 2,751,672 to Reed describes a silo of about 20 feet in diameter, constructed by winding several metal sheets in a series of helical convolutions and bolting the edges together. U.S. Patent No. 3,380,147 to McDonald shows a spirally wound silo of about 21 feet in diameter wherein sheet steel is wound into a helical configuration using guides and crimping rollers; the edges are then welded together to form the wall of the silo. U.S. Patent No. 4,142,284 to Steuber shows a spirally wound storage tank of approximately 30 feet in diameter. U.S. Patent No. 4,121,747 to McFatter shows large storage tanks, typically 31 feet in diameter, constructed from strip metal wound into a spiral pattern and butt-welded together.

Also cited by the examiner was a brochure for a manufacturing system sold by PRD Cortec, wherein spirally formed tubes of corrugated metal, up to 15 feet in diameter, are described for use in low cost housing units, storm sewers, drainage tubes, and culverts. The examiner also cited a "Handbook of Steel" directed to spirally formed steel pipes and arches for use in culverts, storm sewers, subdrains, spillways, underpasses and service tunnels. The Handbook shows steel pipe in diameters of 24 feet or more, and shows such pipe deformed into elliptical shapes and arches of various configurations.

The Board adopted the dictionary definition of "pipe" as "a tubular or cylindrical object, part or passage," and held that on this definition large cylindrical structures such as silos and storage tanks are "pipes" within the meaning and scope of the claims, rendering the claims obvious or anticipated. Mr. Johnston challenges this dictionary definition as unduly broad, stating that the prior art structures would not be understood as included in the meaning of "pipe" by persons of skill in the field of the invention. Mr. Johnston suggests that "pipe" in the construction trades is well understood to mean structures used to carry fluids or as electrical conduits, and that this understanding of the word "pipe" does not include silos and storage tanks.

It is well established that dictionary definitions must give way to the meaning imparted by the specification, Phillips v. AWH Industries, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*), but in this case Mr. Johnston himself gave "pipe" the broad meaning he now criticizes. He states in the specification that his pipes may be used as overpasses, storage buildings, homes, silos, and water tanks, extols the value of his invention in such large-diameter structures, and does not attempt to disclaim such scope from his claims.

The Board observed that the claims were not limited by the method of forming or shaping the spiral pipe, and held that such pipes in the claimed size range were shown or rendered obvious in the cited references. Thus claim 1 was found anticipated by each of the Reed, McDonald, and Steuber patents, for each shows a silo or storage tank in the form of a spirally formed pipe of an elongated strip of material having a diameter larger than 15 feet, as in claim 1. Mr. Johnston did not separately argue dependent claims 2 and 4. We agree that those claims were correctly held to be anticipated, for every claim element is shown in each of these references.

Claim 3, which depends from claims 1 and 2, contains the additional limitation "further including that said wall may be smooth, corrugated, or profiled with increased dimensional proportions as pipe size is increased." The Board ruled that this additional content did not narrow the scope of the claim because these limitations are stated in the permissive form "may." As a matter of linguistic precision, optional elements do not narrow the claim because they can always be omitted. We affirm the Board's ruling that claim 3 as written is anticipated.

Claims 5 through 9 were agreed to stand or fall together. The Board found that the subject matter of claim 9 would have been obvious from the combination of the PRD Cortec brochure and the Handbook of Steel. PRD Cortec shows spirally formed pipe that is larger than 12 feet in diameter but not arched. The Handbook shows examples of helically formed pipe that may be reshaped into "elliptical pipe, horseshoes, arches and other shapes," although each shape is less than 12 feet in diameter. The Board found that it would have been obvious to reshape the PRD Cortec 15 foot diameter pipe into the shapes in the Handbook, citing the Handbook's teaching that round or arched pipe can be

used as storm sewers, drainage tubes, and culverts. Mr. Johnston argues that there is inadequate motivation to combine these two references, on the basis that there is not a specific teaching in the prior art that this subject matter may be combined. He also argues that the Handbook teaches away from making such a combination.

Precedent requires that to find a combination obvious there must be some teaching, suggestion, or motivation in the prior art to select the teachings of separate references and combine them to produce the claimed combination. Karsten Mfg. Corp. v. Cleveland Golf Co., 242 F.3d 1376, 1385 (Fed. Cir. 2001) ("In holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention."); In re Dance, 160 F.3d 1339, 1343 (Fed. Cir. 1998) ("When the references are in the same field as that of the applicant's invention, knowledge thereof is presumed. However, the test of whether it would have been obvious to select specific teachings and combine them as did the applicant must still be met by identification of some suggestion, teaching, or motivation in the prior art, arising from what the prior art would have taught a person of ordinary skill in the field of the invention."); In re Fine, 837 F.2d 1071, 1075 (Fed. Cir. 1988) (there must be "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references"); Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143 (Fed. Cir. 1985) ("When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself."). An explicit teaching that identifies and selects

elements from different sources and states that they should be combined in the same way as in the invention at issue, is rarely found in the prior art. As precedent illustrates, many factors are relevant to the motivation-to-combine aspect of the obviousness inquiry, such as the field of the specific invention, the subject matter of the references, the extent to which they are in the same or related fields of technology, the nature of the advance made by the applicant, and the maturity and congestion of the field. Objective indicia are also relevant, see Graham v. John Deere Co., 383 U.S. 1 (1966), for the commercial response to an invention is a useful control upon hindsight evaluation of obviousness.

These considerations have been extensively illustrated. E.g., Vulcan Engineering Co., Inc. v. Fata Aluminium, Inc., 278 F.3d 1366, 1372 (Fed. Cir. 2002) (continuous lost foam casting); Karsten Mfg. Corp. v. Cleveland Golf Co., 242 F.3d 1376, 1385 (Fed. Cir. 2001) (golf club). Precedent has also recognized that "[t]he suggestion or motivation to combine references does not have to be stated expressly; rather it may be shown by reference to the prior art itself, to the nature of the problem solved by the claimed invention, or to the knowledge of one of ordinary skill in the art." Medical Instrumentation and Diagnostics Corp. v. Elekta AB, 344 F.3d 1205, 1221-22 (Fed. Cir. 2003). These criteria have served to impart objectivity to the determination of obviousness. See In re Rouffet, 149 F.3d 1350, 1358 (Fed. Cir. 1998) (obviousness requires proof "that the skilled artisan . . . would select the elements from the cited prior art references for combination in the manner claimed").

The Board found motivation to combine the teachings of the Steel Handbook and PRD Cortec, in that both references deal with the same field of technology, and both show spirally formed pipe of large diameter. The Handbook teaches the interchangeability of

round and arched pipe in various applications, and recognizes the need to provide greater capacity without increasing height, such as for use in a culvert under a road. The Handbook also teaches that spirally-formed round pipe can be re-shaped into arch shapes to provide greater cross-sectional area for a given height. PRD Cortec teaches the formation of a 15-foot diameter spirally-formed pipe, but does not explicitly show deforming such pipe into other shapes, such as arches.

Mr. Johnston argues that it would not be obvious to combine these teachings, stating that the Handbook describes only spirally-formed arched-steel pipe less than 12 feet in diameter and arched steel pipe made of structural plate bolted together with diameters of over 25 feet, whereas PRD Cortec shows only round spirally-formed pipe. He argues that the Handbook suggests that large-diameter arched-pipe should not be formed helically, but should be bolted together from structural plate. The Handbook states:

Corrugated metal pipe was first developed and used for culverts in 1896. As experience was gained in the use of this thin-walled, lightweight, *shop fabricated* pipe, the diameters gradually increased to 96 in. and larger. Fill heights became greater, even exceeding 100 ft. A further development, in 1931, was structural plate pipe with larger corrugations, for *field assembly*. Diameters and arch spans beyond 25 ft. have been successfully installed.

Handbook at 39. This statement and the other examples in the Handbook were held by the Board to teach the shapes and dimensions of known steel construction products, and not to negate the use of spiral forms. The Board held that one of ordinary skill in this field would have been motivated, by these teachings, to produce large-diameter spirally-formed pipe and to shape them into arch shapes:

In our view, PDR's teaching of a 15 foot diameter spirally formed pipe usable as an irrigation pipe, a drainage tube, a sewer, or a culvert combined with the Handbook's teaching of reshaping spirally formed pipes (less than 12 foot diameter) used for culverts and drainage into an arch shape would have

made it obvious at the time the invention was made to a person of ordinary skill in the art to reshape PDR's 15 foot diameter spirally formed pipe into an arch shape as taught by Handbook. The motivation for this change comes not from appellant's disclosure but from the clear teachings of the applied prior art. In that regard, Handbook teaches using either (1) round spirally formed pipes, or (2) arch shaped spirally formed pipes for use in culverts and drainage. This teaching of two alternative cross-sections provides the necessary motivation for an artisan to have modified the round spirally formed pipe of PDR into an arch shape.

Bd. op. at 20-21.

We agree with the Board that PRD Cortec contains the motivation or suggestion to combine its large diameter pipe with the teachings of the Handbook. PRD Cortec shows the suitability of spirally-formed pipe in large cylindrical/shaped structures, and the Handbook shows large cylindrical/shaped structures. These teachings are in the same field of endeavor and deal with related subject matter. We agree with the Board that it would have been obvious to combine the PRD Cortec and Handbook's teachings to provide spirally formed pipe for large diameter and shaped structures. That decision is

AFFIRMED.